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Proposal to Change the Format of the Capability Codes (CC) and Operational Modes (OM) Subfields in the Aircraft Operational Status Message.

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SUMMARY

The structure of the Capability Codes (CC) subfield in the Aircraft Operational Status Message is overly restrictive and does not provide adequate coding space to accommodate the wide variety of capabilities that a transmitting ADS-B system may need to announce. This paper proposes to relax the restrictions imposed by the structure of the CC subfield as described in DO-260, so that more independent capability codes may be transmitted in a single Aircraft Operational Status message.

2.2.3.2.7.3 "Aircraft Operational Status" Messages

The Aircraft Operational Status Message is used to provide the current status of the aircraft. Format of the message is provided in Figure 2.2.3.2.7.3, while further definition of each of the subfields is provided in the subsequent paragraphs.

"AIRCRAFT OPERATIONAL STATUS" MESSAGE "ME" FIELD									
Msg Bit #	33 - 37	38 - 40	41 - 56	57 - 72	73 -75	76	77- 80	81 - 82	83 - 88
"ME" Bit #	1 - 5	6 - 8	9 - 24	25 - 40	41 -43	44	45 - 48	49 - 50	51 - 56
Field Name	Type = 31 [5]	Subtype [3]	Capability Class Codes [16]	Operational Mode [16]	Ver. No. [3]	NAC Supp. [1]	NIC [4]	SIL [2]	Not Assigned
	MSB LSB	MSB LSB	MSB LSB	MSB LSB	MSB LSB	MSB LSB	MSB LSB	MSB LSB	MSB LSB

Figure 2.2.3.2.7.3: "Aircraft Operational Status" ADS-B Event-Driven Message Format

2.2.3.2.7.3.1 "TYPE" Subfield in Aircraft Operational Status Messages

2.2.3.2.7.3.2 "SUBTYPE" Field in Aircraft Operational Status Messages

2.2.3.2.7.3.3 "Capability Class (CC)" Subfield in Aircraft Operational Status Message

The Capability Class (CC) subfield ("ME" bits 9 through 24, Message bits 41 through 56) indicate operational capabilities present on board the A/V in which the ADS-B transmitting subsystem resides. The format of this subfield depends on the Version Number subfield (section 2.2.3.2.7.3.5) being reported in the Aircraft Operational Status message.

If the Version Number (subsection 2.2.3.2.7.3.5) is 0, the format of the CC subfield is as defined in the initial version of this MOPS, DO-260. This is summarized in Table 2.2.3.2.7.3.3-A below.

Table 2.2.3.2.7.3.3-A: Capability Class Code Encoding in Version 0 Transmitting Subsystems.

"ME" Bits	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**
Message Bits	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**
Content	0 0		TCAS, CDTI		Unused											
	0 1		Unused													
	1 0		Unused													
	1 1		Unused													

In Table 2.2.3.2.7.3.3-A, the coding of the "TCAS, CDTI" subfield is as follows:

Bit 11	Bit 12	Meaning
0	0	TCAS operational or unknown; CDTI not operational or unknown
0	1	TCAS operational or unknown; CDTI operational
1	0	TCAS not operational; CDTI not operational or unknown
1	1	TCAS not operational; CDTI operational

If the Version Number (subsection 2.2.3.2.7.3.5) is 1, the format of the CC subfield is as defined in Table 2.2.3.2.7.3.3-B below.

Table 2.2.3.2.7.3.3-B: Capability Class Code Encoding in Version 1 ADS-B Transmitting Subsystems.

"ME" Bits	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56
Message Bits	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**
Content	0 0		Unused		Reserved for future expansion											
	0 1		TCAS	CDTI	Reserved for future expansion											
	1 0		Reserved for future expansion													
	1 1		Reserved for future expansion													

In Table 2.2.3.2.7.3.3-B, the one-bit TCAS and CDTI subfields are set to ONE if the corresponding functionality on the transmitting aircraft (TCAS or CDTI) is present and operational, or to ZERO otherwise.

2.2.3.2.7.3.4 "Operational Mode" Subfield in Aircraft Operational Status Messages

As indicated in Table 2.2.3.2.7.3.4, the structure and use of the bits in the Operational Mode (OM) subfield in Aircraft Operational Status messages is reserved for future definition.

Table 2.2.3.2.7.3.4: "Operational Mode" Subfield Encoding in Aircraft Operational Status Messages.

"ME" Bits	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56
Message Bits	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**
Meaning	Reserved for future definitioan.l															

2.2.3.2.7.3.5 "Version Number" Subfield in Aircraft Operational Status Messages

The "Version Number" subfield is a 3-bit field ("ME" bits 73 to 75, Message bits 41 to 43) that indicates the version number of the MOPS to which the transmitting ADS-B subsystem complies.

Table 2.2.3.2.7.3.5:"SUBTYPE" Field in Aircraft Operational Status Messages Encoding

Version Number	Meaning
0	The transmitting ADS-B subsystem complies with the initial version of this MOPS, RTCA DO-260.
1	The transmitting ADS-B subsystem complies with the "Revision A" version of this MOPS, RTCA DO-260A.
2-7	Reserved for future growth.

2.2.3.2.7.3.6 "NAC Supplement" Subfield in Aircraft Operational Status Messages

2.2.3.2.7.3.7 Navigation Integrity Category (NIC) Subfield in Aircraft Operational Status Messages

2.2.3.2.7.3.8 Surveillance Integrity Level (SIL) Subfield in Aircraft Operational Status Messages

2.2.3.2.7.3.9 "NOT ASSIGNED" Subfield in Aircraft Operational Status Messages